WHAT IS CLAIMED IS:

1. A method for forming an inductor in a semiconductor device, comprising the steps of:

forming a first photoresist film on a semiconductor substrate in which a given structure is formed, and then patterning the first photoresist film so that a given region of the semiconductor substrate is exposed;

depositing copper by means of a spin-on method using a solution containing nano-scale copper particles, performing a baking process, and then performing an annealing process to form a first copper layer in the patterned first photoresist film;

forming a second photoresist film on the entire structure, and then patterning the second photoresist film to expose given portions of the first photoresist film and the first copper layer;

depositing copper by means of the spin-on method using the solution containing the nano-scale copper particles, performing a baking process, and then performing an annealing process to form a second copper layer between the patterned second photoresist films; and

removing the first and second photoresist films.

2. The method as claimed in claim 1, wherein the nano-scale copper particles are formed with a size in the range of 1nm to 20nm.

3. The method as claimed in claim 1, wherein the solution containing the nano-scale copper particles is deposited at a temperature in the range of -10℃ to 100℃ with a rate in the range of 100rpm to 5000rpm.

4. The method as claimed in claim 1, wherein the baking process is performed in a single step or a multi-stage step at a temperature in the range of 200℃ to 500℃ under a hydrogen atmosphere.

5. The method as claimed in claim 4, wherein the baking process of the single step includes performing a baking process at any one temperature in the range of 200℃ to 500℃ for 1 second to 10 minutes.

6. The method as claimed in claim 4, wherein the baking process of the multi-stage step includes performing a baking process at several temperatures in the range of 200℃ to 500℃ for 1 second to 10 minutes.

7. The method as claimed in claim 4, wherein in case where the hydrogen atmosphere upon the baking process contains hydrogen only, a hydrogen-mixed gas such as hydrogen and argon (0 to 95%), hydrogen and nitrogen (0 to 95%), etc. is used.

8. The method as claimed in claim 1, wherein the annealing process is performed at a temperature in the range of 200℃ to 500℃ under a hydrogen

atmosphere for 1 second to 10 minutes, while a pressure of 0.1 to 100Mpa is applied.

9. The method as claimed in claim 8, wherein the pressure is repeatedly applied once to ten times in a single step, a multi-stage step or a sin curve type.

10. The method as claimed in claim 9, wherein if the pressure is applied using the single step and the multi-stage step, a single gas and a mixed gas are used.

11. The method as claimed in claim 9, wherein if the pressure is applied using the multi-stage step, a process of using a single hydrogen gas or a mixed gas such as hydrogen, argon, helium, etc. and finally using a hydrogen gas, is repeated once to ten times.

12. The method as claimed in claim 1, further comprising performing an annealing process before the first and second photoresist films are removed.

13. The method as claimed in claim 12, wherein the annealing process is performed at a temperature in the range of 50℃ to 500℃ for 1 minute to 5 hours and under a hydrogen, argon, nitrogen or forming gas atmosphere.

14. A method for forming an inductor in a semiconductor device, comprising the steps of:

forming a first photoresist film on a semiconductor substrate in which a given structure is formed, and then patterning the first photoresist film so that a given region of the semiconductor substrate is exposed;

depositing copper by means of a spin-on method using copper precursors, performing a baking process, and then performing an annealing process to form a first copper layer in the patterned first photoresist film;

forming a second photoresist film on the entire structure, and then patterning the second photoresist film to expose given portions of the first photoresist film and the first copper layer;

depositing copper by means of the spin-on method using the copper precursors, performing a baking process, and then performing an annealing process to form a second copper layer between the patterned second photoresist films; and

removing the first and second photoresist films.

15. A method for forming an inductor in a semiconductor device, comprising the steps of:

forming a first photoresist film on a semiconductor substrate in which a given structure is formed, and then patterning the first photoresist film so that a given region of the semiconductor substrate is exposed;

depositing aluminum by means of a spin-on method using nano-scale aluminum particles or aluminum precursors, performing a baking process, and

then performing an annealing process to form a first aluminum layer in the patterned first photoresist film;

forming a second photoresist film on the entire structure, and then patterning the second photoresist film to expose given portions of the first photoresist film and the first aluminum layer;

depositing aluminum by means of the spin-on method using the nano-scale aluminum particles or the aluminum precursors, performing a baking process, and then performing an annealing process to form a second aluminum layer between the patterned second photoresist films; and

removing the first and second photoresist films.

16. A method for forming an inductor in a semiconductor device, comprising the steps of:

forming a first metal layer on a semiconductor substrate in which a given structure is formed, and then patterning the first metal layer so that a given region of the semiconductor substrate is exposed;

forming a first copper layer on the entire structure and then polishing the first copper layer;

forming a second metal layer on the entire structure, and then patterning the second metal layer to expose given regions of the first metal layer and the first copper layer;

forming a second copper layer on the entire structure and then polishing the second copper layer; and

removing the first and second metal layers.

17. The method as claimed in claim 16, wherein the first and second metal layers are formed using one of nickel (Ni), cobalt (Co), titanium (Ti), aluminum (Al), tungsten (W) and tantalum (Ta).

18. The method as claimed in claim 16, wherein first and second copper layers are formed using an electroplating method or an electroless plating method.

19. The method as claimed in claim 18, wherein the electroplating method is performed using a plating solution in which an additive is not added to a solution, in which H_2SO_4 and $CuSO_4$ are mixed in the ratio of 1:99 to 99:1.

20. The method as claimed in claim 19, wherein the electroplating method using the plating solution to which the additive is not added is performed using a forward DC plating method, a pulse-reverse plating method, or a pulse plating method, or a multi-stage plating step in which these methods are mixed.

21. The method as claimed in claim 18, wherein the electroplating method is performed while maintaining a concentration of HCl in the range of 1 to 1000ppm.

22. The method as claimed in claim 18, wherein the electroless plating method further includes performing a process of adding a surface cleaning and activation agent.

23. The method as claimed in claim 16, wherein the first and second copper layers are formed by means of a plating process using a plating solution containing not any additive of polymer components such as a suppressor, an accelerator, a leveler, etc.

24. The method as claimed in claim 16, further comprising the step of performing an annealing process before the first and second metal layers are removed.

25. The method as claimed in claim 24, wherein the annealing process is performed at a temperature in the range of 50℃ to 500℃ for 1 minute to 5 hours under a hydrogen, argon, nitrogen or forming gas atmosphere.

26. A method for forming an inductor in a semiconductor device, comprising the steps of:

forming a first metal layer on a semiconductor substrate in which a given structure is formed, and then patterning the first metal layer so that a given region of the semiconductor substrate is exposed;

forming a first aluminum layer on the entire structure and then polishing the first aluminum layer;

forming a second metal layer on the entire structure, and then patterning the second metal layer to expose given regions of the first metal layer and the first aluminum layer;

forming a second aluminum layer on the entire structure and then polishing the second aluminum layer; and

removing the first and second metal layers.